SUMMARY
Indian mustard is one of the most important oil seed crop belongs to family Brassicaceae. India is the second largest producer of rapeseed-mustard after China. However, the productivity in India is affected by number of biotic and abiotic stresses. The crop is affected by number of diseases which cause severe crop losses and poor seed quality. The stem rot caused by *Sclerotinia sclerotiorum* (Lib.) de Bary has become serious problem in this crop in recent years, causing yield losses up to 72 per cent.

Various aspects of stem rot disease of mustard were studied in detail in view of the severity of the disease and importance of crop. The inference of present study are summarized as follows-

Survey was conducted regarding symptom and incidence of stem rot caused by *Sclerotinia sclerotiorum* in various mustard growing areas of the district. The disease incidence varied from 0 to 25 per cent during crop season 2006-07 and 0 to 20 per cent in 2007-08. The overall Sclerotinia stem rot percentage of Bahraich district was recorded 11.27 per cent in 2006-07 and 8.5 per cent in 2007-08. The maximum disease incidence (25 per cent) was observed in Mihinpurwa block and the lowest incidence (4.9 per cent) was observed in kaiserganj block.
Initial symptoms of disease in field appeared 45 to 60 days after sowing, at about flowering stage. The symptoms of disease appeared near the soil level as elongated, water soaked lesions on stem which later on covered with cottony mycelial growth. Affected plants exhibited stunting and premature ripening, shredding of stem, wilting and drying. Greyish white to black, spherical to elongated sclerotia developed on the surface and in the pith. Cottony mycelial growth and formation of greyish white sclerotia also look on the surface of leaves and siliqua.

Morphological characters of the pathogen were studied in detail. On the basis of that the pathogen causing stem rot of mustard was identified as *Sclerotinia sclerotiorum* (Lib.) de Bary.

Pathogenicity of the isolated fungus was tested in pots with sclerotia and mycelial disc method. Inoculation with mycelial disc method was found superior to sclerotial method causing 72 per cent and 44 per cent infection, respectively in plants with injury and without injury. Sclerotial inoculation being inferior caused infection up to 56 and 20 per cent respectively in injured and uninjured plants. Reisolation from the artificially inoculated plants yielded the same fungus *Sclerotinia sclerotiorum* (Lib.) de Bary.

Variatel screening was made to find out the sources of resistance against the pathogen. None of the germplasm was found free and resistant against the pathogen. Only seven germplasm viz., DHR-9618, JTC-18, TKG-
G-16, HUM-0001, NUDB-09, BAUR-9802, TKG-180-1 showed moderately resistant reaction against \textit{S. sclerotiorum}. While rest of the genotype exhibited different degrees of susceptible reaction (Moderately susceptible-8, Susceptible-9, Highly susceptible-21).

Environmental factors like temperature, relative humidity and rainfall were observed to have profound effect on the disease development. The disease appeared in the 1\textsuperscript{st} week of January in 2006-07. However, in the next crop season disease appeared in the field in last week of December. Maximum temperature around 15\textdegree C and the minimum temperature around 5\textdegree C with more than 80 per cent relative humidity is more prone for disease appearance and its development.

Timely and early sowing (30\textsuperscript{th} September and 15\textsuperscript{th} October) of mustard crop reduced the disease incidence to a great extent and resulting higher crop yield in comparison to late sowing \textit{i.e.} 30\textsuperscript{th} October. Reduction in disease incidence and crop yield after 30\textsuperscript{th} October sowing may be due to the unfavourable weather condition for crop and the pathogen. A higher doses of Nitrogen (120kg/ha.) reduced the disease incidence of Sclerotinia stem rot of Indian mustard while 40 to 80kg/ha. Nitrogen in soil lead to significantly increase disease incidence.

The maximum colony growth inhibition (70.18 per cent) of \textit{S. sclerotiorum} was recorded by \textit{Trichoderma viride} followed by \textit{T. harzianum}.
(68.33 per cent). It was observed that all the tested bio-agents inhibited the growth of test pathogen over control.

The highest disease reduction (90.91 per cent) was observed in seed treatment with *T. viride* + Carbendazim followed by *T. harzianum* + Thiram (81.83 per cent). Seed treatment alone with *T. viride* also proved best and reduced disease incidence up to 81.83 per cent.

The best management of disease was obtained with the spraying of Carbendazim at 10 days interval after appearance of disease in field. The next best effective fungicide for foliar spray was Thiram.

Garlic bulb extract was proved most effective to inhibit mycelial growth by (71.11 per cent) followed by *Azadirachta indica* (50.37 per cent) and *Ocimum sanctum* (38.15 per cent).

In bio-control agents, *Trichoderma viride* proved the best among both the treatments (foliar and soil) and reduced disease incidence 84.24 and 71.94 per cent respectively. The next best effective biocontrol agent was *T. harzianum*, resulting 67.62 and 70.94 per cent over disease control, respectively. The maximum yield of the crop (13.25 q./ha.) was obtained from *Trichoderma viride* (soil treatment) followed by Carbendazim spraying (12.09 q./ha.). All the treatments gave significantly better yield in both the crop seasons.